

DIAGRAM NOTES (ISSUE 1)

concerning

NZPO 34139, ISSUE F

titled

DIGIT ABSORBING AND DISCRIMINATING RELAY SET

(SINGLE DIGIT OPERATION)

An explanation of the above circuitry is covered under the following headings:

1. GENERAL.
2. FACILITY SCHEDULE.
3. OUTLINE CIRCUIT OPERATION
- 3.2 Busying.
4. OPERATIONAL DETAILS.
- 4.1 Seizure
- 4.1.2 Dial Pulse Received.
- 4.2 Release
- 4.2.1 Barred Digit.
- 4.2.2 Through Digit.
5. CIRCUIT DESIGN NOTES.

1. GENERAL.

1.1 This diagram shows the circuit arrangement of a one digit absorbing and discriminating relay set for use with emergency service or special service relay sets.

1.2 Typical diagrams to be considered in conjunction with this diagram are:

Group Selector GBW 10760 or equiv.

Emergency service relay set GBW 15450 or equiv, or

Selector level relay set GBW 16810 or equiv, or

Auto to Auto relay set GBW 16200 or equiv.

1.3 It should be noted that on some relay sets prior to issue F of this diagram the B relay has only five springsets. To distinguish the difference in springset numbering between the two B relays in these notes, bracketed figures are used to indicate the springset numbers for the five springset 1 relay thus, (B1).

2. FACILITY SCHEDULE.

Provision is made for -

2.1 Guarding of the P-wire on seizure.

2.2 Single digit absorbing and discriminating.

2.3 Return of N.U tone to the caller when the digit dialled is barred.

2.4 Switching of positive, negative and P-wire and removal of relay bridge from the line.

2.5 Operation of a meter on calls where the digit dialled is barred, when required.

2.6 Immediate busy facility when used with GBW 16810 or equivalent.

2.7 Busying of the P-wire to the selector banks if the associated relay set is busied or jacked out.

2.8 Busying of the circuit during testing or maintenance work.

3. OUTLINE CIRCUIT OPERATION.

3.1 The relay set is seized by a loop being applied to the positive and negative wires from the group selector. On the receipt of a train of pulses, the miniature unselector steps to the outlet corresponding to the digit received. If the outlet is not strapped for barring, the call is switched through, otherwise N.U tone is transmitted to the caller.

3.2 Busying.

3.2.1 A link is inserted into test jacks 1 and 2 which earths the P-wire to the Group selector multiple.

4. OPERATIONAL DETAILS.

4.1 Seizure.

Relay A operates to the looped positive and negative wires from the group selector.

Relay A operating,

A1 operates relay B.

Relay B operating (ref. par. 1.3)

B1 (B1) prepares a circuit for relay CD and uniselector DS12.

B2 applies a loop to wires A' and B' for immediate busy facility if used with relay set GBW 16810 or equiv.

B3 (B3) prepares a circuit to step uniselector DS12.

B4 (B4) prepares a circuit to operate relay H or NU.

B5 (B2) is ineffective.

B6 (B5) returns an earth on P-wire to selector bank to hold the seizing selector and prevent intrusion by other selectors.

4.1.2 Dial Pulses Received.

Relay A functions under the control of the received pulses. On the first release of relay A, relay CD operates and remains operated until after the end of the digit.

Relay CD operating,

CD1 spare.

CD2 is ineffective.

CD3 short circuits CD winding a-b to make it slow releasing.

CD4 disconnects B4 earth from DS2 bank

The releasing and re-operating of relay A steps the uniselector around the bank.

At the end of the digit relay CD releases.

Relay CD releasing,

CD1 spare.

CD2 is ineffective.

CD3 removes short circuit from CD coil.

CD4 operates relay H or NU relay. See note 1.2 on drawing.

Two alternative conditions may now arise -

(a) Barred Digit.

Relay NU operates to B⁴ earth, via DS2 uniselector bank.

Relay NU operating,
NU1 operates FCS meter.
NU2 prevents any further pulses of relay A reaching DS magnet.
NU3 connects N.U tone to the line via the 570 ohm winding of relay A.

(b) Through Digit.

Relay H operates to B⁴ earth, via DS2 uniselector bank.

Relay H operating,
H1 provides a locking circuit for relay H to the P-wire.
H2 is ineffective at this stage.
H3 prevents any further pulses of relay A reaching DS magnet.
H4 and H5 switch the positive and negative wires to the associated relay set and releases relay A.

Relay A releasing,
A1 releases relay B.

Relay B releasing,
B1 (B1) is ineffective.
B2 removes loop from A¹ and B¹ wires.
B3 (B3) is ineffective.
B4 (B4) disconnects relay H operating circuit.
B5 (B2) is ineffective.
B6 (B5) disconnects earth from the P-wire.

Relay H and the preceding apparatus are then held by an earth on the P-wire from the associated relay set.

4.2 Release.

4.2.1 Barred Digit.

Relays operated, A, B and N.U.

Relay A releases when caller clears down.

Relay A releasing,
A1 releases relay B.

Relay B releasing,
B1 (B1) is ineffective.
B2 removes loop from A' and B' wires.
B3 (B3) operates relay CD (operate lag 25 - 40 milliseconds.)
B4 (B4) releases relay NU.
B5 (B2) provides an earth to restore uniselector DS12 to normal.
B6 (B5) disconnects earth from P-wire.

This opens the P-wire to the selector bank to release the selector.
On the operation of relay CD, operate lag 25 to 40 ms a guard earth is reapplied to the P-wire by CD2 contact.

Relay NU releasing,
NU1 releases meter FCS.
NU2 is ineffective.
NU3 disconnects NU tone from the A relay.

When the uniselector reaches normal position, the earth driving the uniselector is removed which stops the drive and also releases relay CD. Relay CD releasing removes the earth from the P-wire. The relay set is now available for further calls.

4.2.2 Through digit. During conversation relay H is operated. Relay H releases when the earth from the associated relay set is removed from the P-wire. In this condition the calling party would have restored but not necessarily the called party, depending on the type of associated relay set.

Relay H releasing,
H1 disconnects relay H from the P-wire.
H2 operates relay CD and restores uniselector DS12 to normal.
H3 is ineffective.
H4 and H5 reconnects relay A to positive and negative wires.

The P-wire to the selector bank is open when the earth from the associated relay set is removed which releases the group selector. On the operation of relay CD, operate lag 25 to 40 milliseconds, a guard earth is reapplied to the P-wire by CD2 contact. When the uniselector reaches normal position, the earth driving the uniselector is removed which stops the drive and also releases relay CD. Relay CD releasing removes CD2 earth from the P-wire but another guard earth could be present on the P-wire from the associated relay set depending on the type of relay set and if the called party has restored or not. When the guard earth is removed the relay set is available for further cal

5. CIRCUIT DESIGN NOTES.

The reasons for the following slow release relays:

Relay B to ensure its retention during pulsing.

Relay CD is made slow to release by a short circuit of winding
a-b to guard all pulse disconnection periods.

Diodes are used for the following;

D1 Isolates CD coil from DS12 magnet.

D2 Isolates relay H from other relays on the P-wire.

RX1 non-linear resistor to reduce sparking on A1 contact.

DSRX non-linear resistor to reduce sparking on Dsdm contact.

Test jacks 1 and 2 are for busying the relay set, see para 3.2.

Test jacks 3 and 4 are for monitory and testing.

5.1 Design Line Limits. On entry, 2000 ohm loop cable resistance.
 On exit , N.A.

END OF DIAGRAM NOTES